MEN AND MACHINERY.

BY STARR HOYT NICHOLS.

THE first matter to be settled before a correct view of any subject can be formed is the question, What are the facts of the case? That settled, we may reason intelligently about it; otherwise, with the courtiers of Charles the Second, we may long be looking for reasons why a fish weighs more out of a vessel of water than in it, and we shall have only our search for our pains. Perhaps if Bishop Potter, before expressing, in his article in a recent number of this REVIEW, his very kindly anxiety respecting the injury done to mechanics by the monotony of much of their work and its inevitably debasing effect upon them, had instituted a wide inquiry as to whether in fact machinery had exerted any such effect upon mechanics, he might have found that his sympathy was wasted. The Bishop, indeed, followed excellent authorities, but possibly he was over hasty in doing so. "Error lurks in libraries," says Goethe, and so it does in authorities. The sun should have gone around the earth, doubtless, as many scholars, philosophers and observers of former days said it did. But it did not.

So when Mr. Whately Cooke Taylor accents quite truly the supremacy of the machine in modern work over the mechanic, the proper thing to do is not to lament such supremacy as an evil, and then ask, "How far this supremacy shall be allowed to extend?" but rather to inquire whether the supremacy is an evil or a good, and afterwards to lament or rejoice according to the conclusion established.

Mr. Hobson also, in his "Evolutions of Modern Capitalism," while conceding that "the work of a machine-tender calls for judgment and carefulness," laments that these qualities are confined within ever-narrowing limits, till they reach the very nar-

rowest in attention to the monotonous repetition of the same act, and he thinks the gain therefrom is less than its injury to workmen. Professor Nicholson thinks that "machinery of itself does not tend to develop the mind as the sea and mountains do." Dr. Arlidge says, "it arouses no interest and has nothing in it to quicken or brighten the intelligence." Mr. D. A. Wells says, "it dulls by its monotony the brains of the employee to such an extent that the power to think and to reason is lost." A railway superintendent avers that the best engine drivers are those who are most unintelligent and mechanical in their work, and Mr. Hobson again asserts that since the "law of machinery is a law of statical order," and the law of life is dynamic, requiring order as the condition of progress; since "variety is of the essence of life and machinery is the enemy of variety," machinery is the enemy of life.

But if these authorities had asked workmen in various detailed industries whether, as a matter of fact, the workmen who labor at one fragment of a machine are noticeably duller than their comrades, they would have found that this is not the case. They might have inquired among the bicycle makers, or the sewing machine makers, or the glass makers, or the garment makers, or anywhere else, and they would have discovered that men who did but one little thing in those industries were quite alive and quick-minded; that they were bright enough to have baseball nines for their leisure, and nines too that were proficient in the best points of the game, and able to contest victory with men not so employed. They would have heard that monotonous work, being easy, relieved the strain of mind and body which varied hard labor entails, and left the workman not too tired at night to go to his club or his union and hear discussions as to rights and wrongs of labor; and that it is the freshness with which these parties can enter into discussions which occasion their discontent, and not the dullness of their tasks. In fact, it is easy to see that mechanics as a class are far brighter and more intelligent than day laborers and farm hands, though both of the latter have multifarious things to do. These change the form of their work every few minutes, yet both remain much the same for fifty years together, making no progress, rising little in the scale of their work, or their capacity for affairs, or their wage-earning power. Whereas mechanics are always advancing in one way or another and are really the centre

of all the energy and force of the laborers' movement. Who would ever go to toilers of the sea, or to railroad diggers, whose occupations are varied, to inculcate ideas or inaugurate a social change? But mechanics hear, discuss, resolve, and adopt or reject many notions for better or worse. Their work has notoriously broadened and quickened them. They are more acute, not less; more reasoning, not less; more interested in life and not less, than those whose industries are more various and interesting.

Nor is the reason of the mechanic's superiority, development, in spite of the monotony of his work, far to seek. In the first place machines and factories bring workmen into close association, and man sharpens the face of man much more than seas and mountains do, more than variety of work does. Men educate each other mostly, and the more monotonous the work, the less it engages the workman's mind and the more he casts about for entertainment and diversions with his companions who are near at hand. Trees and open fields and animals, calling for much especial variety of dealing, make but farmers and cowboys and stablemen, who, compared in wits with mechanics, are distinctly of a less active type. No one would go to them to air his theories of social change, or his proposals for improving conditions under which laborers shall live. In truth, the close association of men herded together in factories and towns is the main cause of the superiority of the modern man over his predecessors and forebears. Mechanics have freed their minds by freeing their bodies first, and then developed them by attrition with other minds of like grade. The machine alone, if they had been alone with it, might have blunted their powers; but it could not come to one alone, it required many to work it. An ancient weaver, throwing his shuttle back and forth by hand, toiled without comrades, almost as solitary as were Crusoe and Friday. He became expert in patterns and colors, as rug makers are, but that was all. To the larger horizons eagerly scanned by modern groups of men eager for socialism, or higher wages, or shorter hours, or better factories, or more schools, his eyes would be as dull as those of fisherman or shepherd. It is not monotony of employment that dulls; it is monotony of social surroundings and companionship. A man may dip pin-heads all day and be all the more spirited for association with his comrades when his day is done—and so, in fact, he is. When a carpenter had his wood to saw and plane

and chisel by sheer dint of strong muscle, he exhausted his whole energy in his day's work and was ready for nothing but supper and sleep when the stars came out. But a modern carpenter, who has all those slow and toilsome tasks done for him by mills, is quick and vital when his lighter task is done, and joins with his mates to inquire whether or not the single tax would be good for him and his fellows.

One risks nothing in saying that our own times are times of machinery beyond everything else, and that our people are as much ahead of all former times in activity of mind and quickness of interest in life and thought as they are in speed of travel and quantity of goods produced. If one wishes to find sleepy-headedness, slow wits, stupid looks, dull apprehension, he must visit mountain villages, where everybody has to do everything, where are countless varieties of duties for each, but lives dismally monotonous.

The Brook Farm experiment may lend us some instruction to the same end. They were clever men, the best wits of their generation, who believed that variety of employment was good for the mind, so they farmed and philosophised awhile, and with so much success that their shining Apollo, Emerson, afterwards wrote that "though no land is bad, land is worse," and declared that a man might weed his garden till he lost all track of his ideas.

It is well for the shoemaker to stick to his last; it is better still if one does nothing but supervise a lasting machine or a peg-driving machine or a forming machine, or what not. He may not learn so much about making whole shoes, but he will certainly know a great deal more about many higher themes—and to know all about shoemaking is not much of an object in life. Many people live very intelligently without a deep knowledge of dress-making or tailoring or carpentering, or any of these things, and their lives are entirely discontented notwithstanding.

Mr. Whately Cooke Taylor, therefore, may spare his lamentations as to the impending supremacy of machinery. The machine's perfection is man's release from toil. The more it does, the freer is the mechanic. If we could devise a harvester which would drive itself over a field, oil and repair itself, arrange weathers to suit farms, and generally leave farmers to read papers, consult books and visit their neighbors, the farming community would

greatly profit by the change. They would be free to attend to chemistry, landscape gardening, the study of soils and other higher matters; but now they are nature's drudges and bond-slaves from excessive toil.

Dr. Arlidge, too, may cease his forebodings. Perhaps "variety is the essence of life, and machinery is the enemy of variety," without its being true that machinery is, therefore, the enemy of life. For the machine does the man's work for him and releases the man. He escapes into variety. Work is not man's chief end; rather is enjoyment of life his end, and life is more than work. The vast variety of the modern world has been brought out by machineries which have released man's hand and mind, and the dullest plodders at machines have more variety of life than any dwellers on wide steppes, or variously employed hunters of primeval woods. If variety of tasks developed mind, the maid-of-all-work ought to be the brightest of her sex, and the jack-at-all-trades the cleverest of men; but they are not.

Finding, therefore, as we do, in machinery the greatest motor of progress and the deliverer of mankind from grinding toil and debasing poverty; finding also that the mechanic is eager, intelligent, progressive, we feel no apprehension respecting some other ultimate effect of machinery upon mechanics and the world. True, the modern mechanic is the forefront of modern discontent, and by his unions and strikes makes himself felt most uncomfortably, and it is true that the machine has made him so; but it has made him so not by "the strain of its monotony;" nor is it the effect on his nervous system of monotony, since the most skilful and least monotonously employed are most discontented. Slaves live far more monotonously than he and yet develop no general unrest. One never hears of strikes among Eastern shepherds and graziers, nor among desert Bedouins, where monotony reigns supreme. The mechanic is discontented because he sees many people better off than himself and wishes to be as well off as they. He wishes to better his condition, and machines have made so many rich that he thinks they should do as well by him. He is contriving to see if he cannot make them do so, and his discontent is not ominous; it is promising. He ought to be discontented; his condition is far below what he should make it. He does well to think and talk of making it better. If he were contented as he is, he would be a poor-spirited creature, unable

to rise. The source of all advance is just this discontent with one's conditions. Let contentment take possession of any class and its future is doomed. Neither man nor nation rises after that. China droned and drowsed for centuries because of her patience. Late be the day when the American shall stupefy himself with the "drowsy syrup" of content.

And the discontent of mechanics and others will have its way, not in "a day of reckoning," not, as anarchists foretell, in another French Revolution; not in a "painful and costly awakening" of the comfortable classes to exasperating conditions among toilers; not in anything dramatic, spectacular, violent, nor in great floods of benevolence. It will make its way to better conditions through the further supremacy of that very machinery concerning which we are asked, "How far shall this supremacy be allowed to extend?" One might as well ask how far the supremacy of a weather-wave should be allowed to extend. We are here in the sweep of irresistible natural forces, no more to be resisted by States or votes or unions or devices, than is the swelling of tides or the course of winds in the sky.

This machinery, which has already released mankind from bondage to space through locomotive and bicycle, from bondage to time through the telegraph, from bondage to ignorance through cheap printing, from rags and nakedness through abundant clothes, from famine through abundant food, from cold through warm houses, from dangers of the sea through mighty steamers, from poverty through multifarious and miraculous plenty of production, from thousands of discomforts and perils by thousands of inventions—this machinery, which has lifted man out of the isolation, distrust, hatred, and narrowness of former days, is surely equal to its remaining task of making its own benefits so general and all-providing that the workman will find himself comfortable and happy because he too shall dwell in the midst of plenty. What we need to attain this end is only better machines which shall produce ten or an hundred times as much as that now produced, with one-tenth or less of the labor; machines which shall make the necessaries of life so plenty and cheap that low-priced laborers can buy all they need; machines that shall tax the mechanic's energies so little that he shall prefer to attend them rather than pass his time in idleness; machines that shall do all the drudgery of work, leaving to labor

only the finer intellectual and artistic parts; machines that, like electricity, shall attend to all his errands *en route*, and complete his labors almost as easily as now the sun and the rain raise his crops, and more uniformly.

Against this most beneficent agent and chief creator of general welfare, it is true, are banded together at present many an interest and many a mistaken philosopher. The mechanics themselves are at war with the progress and dominance of machinery. They see in it their daily and tireless foe, which is always winning new fields from them, taking away their jobs, destroying the usefulness of their fingers by its greater speed and accuracy, ruining their prospects, supplanting their knowledge. Every new and better machine seems to throw many men out of work, and they see no end to it if "the supremacy of machinery is to be allowed to go on." Every day there is something new, and every day some one loses his place because a better machine dispenses with his services; so they hate machines and sometimes smash them, and always oppose new ones. That every one of them is better off for past inventions they forget; that railroads, steamboats and machines of past times of every kind have given to workmen comforts, luxuries, pleasures, beyond the wildest dreams of their forefathers, they ignore. All they see is their job and its loss. No wonder it is so; the job is their daily living. No one can lose the bread from his mouth without rage and fear. But they should look a little further ahead and see that the more machines there are the more men are employed. Shut off the steam and electric works from New York City to-day, and to-morrow one-half of New York would be obliged to move out of town. The city could not even feed one-half its population at hand labor. Two-thirds of them would have to leave and go to the country to get work and bread. The more machines produce, the more there is for everybody; and the more there is wanted, the more work there is for everybody. Because one merchant fails, there is no reason for all merchants to rail and storm. Mechanics must learn to manage better. Because one class of laborers lose their work temporarily, the rest need not chafe and strike. The only way is to manage to know more, to be quick to shift to new conditions, to be ready to change and to learn novelties. The world must improve, though the individual is hurt. We build railroads and canals, though men are killed

doing it. We mine coal and sail ships and run electric wires and break horses and blast rocks, though lives are lost at these and other employments. In the same way we must go on inventing and using improved machines, though some are thrown out, because that way lie the prosperity and plenty of the future world.

Another class who oppose machinery are the artistic, who clamor for beauty in everything. Ruskin is their distinguished prototype. But beauty is only a secondary consideration in life. The first thing is to live and then to live beautifully, and so long as the machine increases the comforts, conveniences and utilities of life, we must hail its prevalence. Beauty may come later, if it cannot come first. But as a matter of fact, the most beautiful thing ever known to man is the gift of machinery. Where in former days art was narrow and small, within the reach of few, now it is widespread and descends to the enjoyment of the many; so that we have but to lift up our eyes to see that beauty now blossoms on every side where formerly it was confined to the church, the museum and the palace.

The third class who oppose machinery are the short-sighted sentimentalists. They hear that workmen are thrown out of place by some new inventions which enable one to do the work of five, and straightway lament, forgetting that the new device enriches fifty consumers where it temporarily injures one workman. They deplore the monotony of machine work, forgetting that the majority of human minds are weak, and slow, and could do little in the world but for simple tasks adapted to small and barren brains. Those monotonous toils suit them exactly; and the better minds quickly rise out of that class to something better. The exact and punctual habit, which the machine engenders, trains careless minds with a discipline most wholesome. He who without the machine would be clumsy, slow-witted and left-handed is drilled by it into quickness and dexterity, till he becomes expert and superior. The machine has this virtue, that the sight of its own complexities stimulates clever operatives to study to understand it better and to rise to mastery in the use of it. He who begins as a pinhead dipper in his youth often ends as a master mechanic or inventor. There is no barrier. Only those remain below who choose to do so, the fittest mount. And those who are left are left because their places suit their abilities; without such places they would be unemployed.

And discontent does not arise among the lowest class of workmen; it springs and ferments among the best, and is simply a part of the universal and laudable desire of man to better his condition and to repine because it is hard work to do so.

But the improvement will come and will reach a height which we who now live would regard as a wild dream, an "Arabian Nights" romance. And it will come, as all past improvements have come, through improvements of tools and machineries, for these alone can increase the plenty and resources of mankind. When invention shall have improved mechanical devices so that fifty yards of cloth can be produced as quickly as one now, and for the price of one, each man can have fifty for one. When a pound of coal can be turned into four-fifths of its power, instead of only one-fifth as now, mankind will have power to give away. When the farmer shall have devised means to multiply his crops ten or twenty fold, bread will be almost free. When houses can be built for a song, they will rent for a song.

When, in short, abundance of things is so great as to be only less than that of air and water, then will mankind revel in plenty, and the miseries of cold and hunger and raggedness and ignorance and grinding toil and desperate need will pass away. And this plenty machinery carries in its train, as it sweeps forward to its conquests, though mechanic, artist, sentimentalists, public opinion and foolish law fight never so hard against it. The stone which the builders join in rejecting will become the head of the corner. If all would conspire to establish and then forward its onward movement, its benefits would come with accelerated speed, since now it has to make its way against curses, and often against strikes and stones, and combinations manifold. Nothing can be more melancholy than to see lovers of their kind in the ranks of its opponents, because of some few incidental and temporary harms from it. It reminds one of Eastern mobs, who in frenzy assault physicians on suspicion that they are spreading the plague. But though hindered, its progress cannot be stayed, and its supremacy "will be allowed" to extend to the ends of the earth, because of its unrivalled beneficence.

What Henry George expected through his single tax, a millennium of plenty, will come through improved machinery. What statesmen expect through just laws, a millennium of order and progress, will come through improved machinery. What

moralists and reformers expect through excellent sentiments and right reason, a millennium of virtue, will come through improved machinery. What prohibitionists desire through legislation, a millennium of temperance, will come through improved machinery. What socialists and anarchists seek for by new industrial conditions, a millennium of comfort to all classes, will come through improved machinery. What the Church seeks to bring about upon the earth, a millennium of peace and good will to men, will come through improved machinery. For machines multiply goods into plenty, and plenty broadcast means peace and kindness and comfort and temperance and gracious thoughts and reasonable minds and civil order and equal laws. A natural plenty like that of Samoa does not mean all these things; but a made and manufactured plenty, by reason of the industry it engenders, brings all millenniums in its hands, and nothing else can. Therefore, its agent, the machine, must prevail, whoever may oppose.

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